	Factsheet - Filtering Facepiece Respirators (FFRs)	Issue Date:	August 15, 2022
		Version:	1.1
		Originator:	HSE

Introduction

A respirator is a personal protective device that is worn on the face, covers at least the nose and mouth, and is used to reduce the wearer's risk of inhaling hazardous airborne particles (including dust particles and infectious agents), gases or vapors. Filtering facepiece respirators (FFRs) specifically remove airborne particles and aerosols (airborne droplets) from the inhaled airstream of the wearer. They may be referred to as "N95 respirators". They are also sometimes called disposable respirators because the entire respirator is discarded when it becomes unsuitable for further use because of hygiene, excessive resistance, or physical damage.

FFR Basics

FFRs form a tight seal against the user's face, covering the nose and mouth. As the user inhales air through the facepiece, particulate/aerosol material collects on the fibrous material of the filter, which removes the contaminant from the airstream. An FFR may have an exhalation valve located on the filter, which reduces breathing resistance during exhalation.



FFRs are divided into classes based on their filtration capabilities. "N95" is a term referring to the N95 filter class, which removes at least 95% of airborne particles using a "most-penetrating" sized particle during "worst case" testing. The FFR classes include N (not resistant to oil), R (somewhat resistant to oil), and P (strongly resistant to oil) series, which are available at 95, 99, and 100 filtration efficiency levels.

FFRs provide protection against particles/aerosols, but not gases or vapors, and should not be used for respiratory protection to protect against hazardous gases or vapors. These classes and oil-resistant designations are applicable to all types of air-purifying respirators.

- N95, N99, N100 – Filters at least 95%, 99%, 99.97% of airborne particles. Not resistant to oil.
- R95, R99, R100 – Filters at least 95%, 99%, 99.97% of airborne particles. Somewhat resistant to oil.
- P95, P99, P100 – Filters at least 95%, 99%, 99.97% of airborne particles. Strongly resistant to oil.

Note: The coronavirus (e.g. SARS-CoV) has a "shell" composed of lipids, which are fats and oils. However, the amount of fat and oil in these tiny virus particles is extremely low and is not enough to affect the filter in the N-series respirator. Thus the N-series respirators such as N-95 will protect against coronavirus exposure.

FFR Requirements

- Where the use of FFRs is mandatory at KAUST, medical evaluations, training and fit testing are required. See KAUST requirements - [Respiratory Protection Program](#).
- Use only U.S. NIOSH approved or EN149 (European Standard) approved FFRs.
- For proper protection, a respirator must properly be fit tested to ensure a good seal. Face shape, facial hair, eyeglasses, missing dentures, and certain skin conditions can all affect how a respirator fits.
- Respirator users must be clean shaven as beards, moustaches, goatees, long sideburns, stubble, etc. will affect respirator seal to face and decrease effectiveness.

Version: 1.0	Page No. 1 of 4	Factsheet - FFRs
--------------	-----------------	------------------


Factsheet - Filtering Facepiece Respirators (FFRs)


Issue Date:	August 15, 2022
Version:	1.1
Originator:	HSE




- Respirator users must know the FFR limitations including no protection against chemical gases and vapors.
- FFRs must always be inspected prior to donning (wearing). The inspection should check for holes, torn, ripped, dirty, worn out or missing straps and replace if damaged.
- FFRs are designed to be discarded after a single use; DO NOT reuse FFRs when exposed to infectious biological agents.
- Surgical masks **are not** respirators and have limited protection (large droplets, splashes):
 - CDC Infographic: [Understanding the Difference: Surgical Mask and N95 Respirator](#)
 - OSHA video: [The Difference between N95 respirators and surgical masks](#)
- FFRs are available at the [Chemical Warehouse](#) SAP Material # 3000009840, 3000009841); size S/M and M/L.

User Seal Check

A user seal check is a procedure conducted by the respirator wearer to determine if the respirator is being properly worn. The user seal check can either be a positive pressure or negative pressure check. User seal check must be performed each time the user don (wear) on a respirator.

Step 1		Place the respirator over your nose and mouth. Be sure the metal nose clip is on top.
Step 2		Pull the top strap over your head until it rests on the crown of your head above your ears.
Step 3		Pull the bottom strap over your head until it rests just below your ears.

	Factsheet - Filtering Facepiece Respirators (FFRs)	Issue Date:	August 15, 2022
		Version:	1.1
		Originator:	HSE


Step 4		Using both hands starting at the top, mold the metal nose clip around your nose to achieve a secure seal.
Step 5		Non-Valved Filtering Facepiece Respirator Place both hands completely over the respirator. Be careful not to disturb the position of the respirator. Inhale gently and you should feel the respirator collapsing if properly sealed (negative pressure). You can also exhale gently and feel slight positive pressure being built up inside the facepiece without any evidence of outward leakage of air at the seal. If air leaks around the nose, readjust the nosepiece. If air leaks at the respirator edges, work the straps back along the sides of your head. If you cannot achieve a proper seal, DO NOT use the respirator. Contact your PI, supervisor or HSE@kaust.edu.sa
		Valved Filtering Facepiece Respirator If the FFR has an exhalation valve, negative pressure seal check should be performed. To conduct a negative pressure seal check, cover the filter surface with your hands as much as possible and then inhale. The facepiece should collapse on your face and you should not feel air passing between your face and facepiece. If air leaks around the nose, readjust the nosepiece. If air leaks at the respirator edges, work the straps back along the sides of your head. If you cannot achieve a proper seal, DO NOT use the respirator. Contact your PI, supervisor or HSE@kaust.edu.sa

OSHA video: [How to Perform a User Seal Check with an N95 Respirator](#)

Additional information on respiratory protection:

1. KAUST HSE Respiratory Protection Program: <https://hse.kaust.edu.sa/services/industrial-hygiene>
2. [OSHA Standard 1910.134 – Respiratory Protection](#)
3. OSHA Fact Sheet: “Respiratory Infection Control: Respirators Verses Surgical Masks”, <https://www.osha.gov/Publications/respirators-vs-surgicalmasks-factsheet.html>
4. 3M Wearing it Right: <http://multimedia.3m.com/mws/media/407380/3m-filtering-facepiece-respirator-fitting-instructions.pdf>

Version: 1.0	Page No. 3 of 4	Factsheet - FFRs
--------------	-----------------	------------------

 جامعة الملك عبد الله للعلوم والتقنية King Abdullah University of Science and Technology	Factsheet - Filtering Facepiece Respirators (FFRs)	Issue Date:	August 15, 2022
		Version:	1.1
		Originator:	HSE

5. OSHA Fact Sheet: “Protecting Workers during a Pandemic”,
<https://www.osha.gov/Publications/OSHA-FS-3747.pdf>